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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/517,724 | 12/10/2004 | Mario Andjelic | P16519US1 | 6053 |

27045 7590 01/26/2007

ERICSSON INC.
6300 LEGACY DRIVE
M/S EVR 1-C-11
PLANO, TX 75024

| EXAMINER | |
|---|---|
| SEYE, ABDOU K | |
| ART UNIT | PAPER NUMBER |
| 2194 | |

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
|---|---|---|
| 3 MONTHS | 01/26/2007 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/517,724 | ANDJELIC, MARIO | |
| | Examiner | Art Unit | |
| | Abdou Karim Seye | 2194 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *03* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *20 November 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 December 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

WILLIAM THOMSON
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/10/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Response to Amendment*

1. The amendment filed on November 20, 2006 has been received and entered. The amendment amended Claims 1, 15, 20 and 27. The currently pending claims considered below are Claims 1-29.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> b) The invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-8, 15-23 and 27-29 are rejected under 35 U.S.C. 102(b) as being anticipated by Cezary Dubnicki, Liviu Iftode, Edward W. Felten, Kai Li "Software Support for Virtual Memory-Mapped Communication", 1996, pages 372-381.

Claims 1, 15, 16, 17 and 27-29, Dubnicki discloses a network device driver architecture for enabling access between operating system kernel space and a network interface controller (NIC) as well as between user space and said NIC, comprising:

a kernel-space device driver adapted for enabling access between kernel space and user space via a kernel-space-user-space interface (fig. 3, section 5.3,page 378, col. 1); and

user-space device driver functionality adapted for enabling direct access between user space and said NIC via a user-space-NIC interface, wherein the user-space device driver functionality provides direct, zero-copy user-space access to the NIC. (fig. 3, section 5.3; section 3,page 374, col. 1) Said user-space device driver functionality adapted for interconnecting said kernel-space-user-space interface and said user-space-NIC interface to enable integrated kernel-space access and user-space access to said NIC (fig. 3, section 5.3, page 378) .

Claims 2 and 19:Dubnicki discloses network device driver architecture as in claims 1, 15, 17 and 27 above and further discloses that the kernel-space device driver is adapted to said user-space device driver functionality (fig. 3, section 5.3, col. 1, page 378).

Claims 3 and 18, Dubnicki teaches

wherein said user-space device driver functionality is adapted for fetching pointer information, pointing to data in a common memory, from a memory buffer associated with one of said kernel-space-user-space interface and said user-space-NIC interface and inserting said pointer information into a memory buffer associated with the other of said interfaces, thereby interconnecting said kernel-space-user-space interface and said user-space-NIC interface (section 3, col. 2, page 373; col. 1, page 374; section 4, page 374) .

Claim 4, Dubnicki teaches

wherein each of said kernel-space-user-space interface and said user-space-NIC interface is associated with two memory buffers, a transmit buffer and a receive buffer (section 3, col. 2, page 373; col. 1, page 374; section 4, page 374).

Claims 5 and 20, Dubnicki teaches

wherein, for outbound kernel-level protocol communication, said kernel-space device driver is adapted for inserting pointer information, pointing to data in a common memory, into the transmit buffer associated with said kernel-space-user-space interface, and said user-space device driver functionality is adapted for fetching said pointer information therefrom and inserting it into the transmit buffer associated with said user-space-NIC interface, and said NIC is adapted for fetching said pointer information from the transmit buffer associated with said user-space-NIC interface and for reading corresponding data from said common memory based on the obtained pointer information (section 3, col. 2, page 373; col. 1, page 374; section 4, page 374).

Claims 6 and 21, Dubnicki teaches

wherein, for inbound kernel-level protocol communication, said NIC is adapted for inserting pointer information, pointing to data in a common memory, into the receive buffer associated with said user-space-NIC interface, and said user-space device driver functionality is adapted for fetching said pointer information from the receive buffer associated with said user-space-NIC interface and inserting it into the receive

buffer associated with said kernel-space-user-space interface, and said kernel-space device driver is adapted for fetching said pointer information for transfer to a kernel-level protocol, which reads the corresponding data from said common memory based on the pointer information ( section 3, col. 2, page 373; col. 1, page 374; section 4, page 374).

Claims 7 and 22: Dubnicki teaches

Wherein said user-space device driver functionality is configured for execution in application context of a user application (fig. 3; page 374, col. 1, section 3)

Claims 8 and 23: Dubnicki teaches

Wherein said step user-space device driver functionality is implemented as user-space library functionality (fig. 3).

**Claim Rejections - 35 USC § 103**

4. The following is a quotation of 35 U.S.C. 103 (a) which forms the basis for all obvious rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 9-11, 12-14 and 24-26 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Cezary Dubnicki et al ( "Software Support for Virtual Memory-Mapped Communication", 1996, pages 372-381) in view of Massa et al: **(US6658469).**

Claims 9-11,13-14 and 24-26: Dubnicki discloses a network device driver architecture as in claims 1, 15, 17 and 27 above comprising a user-space device driver and a kernel-space device driver, but does not explicitly disclose a first and second operational mode; switching operational mode in response to user application failure and if no call from user-space device driver functionality for a predetermine period of time. However in the same field of endeavor Massa discloses a system and method for directing data transfer between applications and devices using a transport provider switch that is set to select first a primary transport provider if no call from an application connect request for a predetermine period of time and switching to a secondary transport provider if the primary transport provider fails to process the application connect request (fig. 3. col. 8 line 47-67).

Therefore it would be obvious to one having ordinary skill in the art at the time the invention was made to modify Dubnicki's invention with Massa's invention to make the same invention, because it would have maximize the communication bandwidth and minimize the communication latency observed by the communication applications. One would have been motivated to use alternative transport provider; the network transport switch in order to improve data transfer performance by applying an adaptive flow

control protocol that adjusts its data transfer strategy based on the behavior of the communication applications.

Claim 12, Dubnicki teaches

wherein said kernel-space device driver comprises:

a kernel-space agent for managing said kernel-space-user-space interface (section 4, col. 1, page 374);

a network device driver core operable for directly accessing said NIC in said first operational mode, and operable for routing outgoing data to said kernel space agent and for receiving incoming data from said kernel space agent in said second operational mode (fig. 3, page 378).

***Response to Arguments***

6. Applicant's arguments filed November 20, 2006 have been fully considered but they are not persuasive.

a. Claims 1, 15 and 17 Applicant argues that, "any of the references cited including Cezary Dubnicki et al do not teach Zero-copy user space access to NIC". Dubnicki teaches zero-copy such as direct transfer of data from user space to the network/NIC in (fig. 3). See the rejection above.

b. Claims 2-14, 16, 17-26 and 28-29 see rejection above.

***Conclusion***

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Abdou Seye whose telephone number is (571) 270-1062. The examiner can normally be reached on Mon - Fri, 7:30am - 4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Thomson can be reached on 571-272-3718. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

WILLIAM THOMSON
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

AKS
January 21,2007

William Thomson
Supervisory Patent Examiner